

### **REMARKS**

Claims 28-29 are objected to for minor informalities, and claim 27 stands rejected under 35 U.S.C. § 112, second paragraph as allegedly being indefinite. It is respectfully submitted that the enclosed amendment renders the aforementioned objection/rejection moot. Accordingly, it is respectfully requested that the objection/rejection be withdrawn.

Claims 15-17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ishizaki et al. '109 ("Ishizaki") in view of Applicants admitted prior art ("APA"). Claim 15 is independent. This rejection is respectfully traversed for the following reasons.

Claim 15 recites in pertinent part, "forming a metal film over one of the first and second electrodes, wherein the metal film has a thickness of 10  $\mu\text{m}$  or more." The Examiner admits that Ishizaki does not disclose the claimed metal film. The Examiner therefore modifies Ishizaki by adding the bonding pad 108 of APA thereto, so as to be the claimed "metal film" in the proposed combination. However, APA is silent as to the thickness of the bonding pad 108. Indeed, a conventional bonding pad would have a thickness of less than 10  $\mu\text{m}$ . Accordingly, even assuming *arguendo* proper, the proposed combination does not disclose each and every limitation recited in claim 15 in the particular manner defined therein.

Moreover, it is respectfully submitted that the aforementioned structural difference between claim 15 and the proposed combination emphasizes a broader difference between the cited prior art and this aspect of the present invention. For example, as described throughout Applicants' specification, the claimed metal film and recited thickness thereof can enable the metal film to provide various functionalities. According to one object of the present invention, the series resistance at the semiconductor multilayer film can be reduced, and the heat radiation

can be greatly improved. In addition, the extremely thin semiconductor multilayer film can be supported by the metal film having a thickness of 10  $\mu\text{m}$  or more, and thus the element separated from the substrate can be easily handled.

In contrast, the alleged metal film 108 of APA is merely a bonding pad, which is distinct from a metal film having a thickness of 10  $\mu\text{m}$  or more that can support the semiconductor multilayer. Indeed, as mentioned above, a conventional bonding pad would have a thickness of less than 10  $\mu\text{m}$  and would not be capable of, nor be designed for, supporting the semiconductor multilayer.

In view of the foregoing, it is respectfully submitted that the cited prior art does not disclose or suggest, *inter alia*, “forming a metal film over one of the first and second electrodes, wherein the metal film has a thickness of 10  $\mu\text{m}$  or more” in combination with the other features recited in claim 15.

Claims 18-21, 26 and 28 stand rejected under 35 U.S.C. § 103 as being unpatentable over Ishizaki in view of APA and Cheung et al. ‘795 (“Cheung”). Claim 26 is independent. This rejection is respectfully traversed for the following reasons.

**A. Proposed combination improper**

Claim 26 recites in pertinent part, “bonding a first supporting material, *which is made of a plastic material or a metal*, in film form for supporting the semiconductor multilayer film onto the semiconductor multilayer film” (emphasis added). According to one aspect of the present invention, in the case where the semiconductor multilayer includes, e.g., a heteroepitaxial layer of which composition is different from that of the substrate, the epitaxial layer could be warped.

However, the supporting material, which is made of a plastic material or a metal, in film form can nonetheless be bonded onto the warped semiconductor multilayer.

It is respectfully submitted that the Examiner's rejection of claim 26 is *per se* improper. In particular, the Examiner admits that Ishizaki does not disclose a supporting material and merely alleges that Cheung discloses the claimed supporting material (*see* page 7 of outstanding Office Action). However, the Examiner has not attempted to modify Ishizaki by adding the supporting material of Cheung, let alone provide the requisite motivation/rationale from the prior art for doing so. It should be noted that the asserted motivations on page 6 of the outstanding Office Action are directed to different modifications for different claims.

The Examiner has not provided the requisite *objective* evidence *from the prior art* that "suggests the desirability" to modify Ishizaki with the teachings of Cheung related to the feature recited in claim 26. Indeed, patentable subject matter typically arises from using *known* elements/processes in novel *combinations*. Accordingly, the Examiner's allegation that the claimed features of claim 15 and 26 are allegedly well-known *separately* is irrelevant to the determination of patentability for the *combination* thereof.

The Examiner is directed to MPEP § 2143.01 under the subsection entitled "Fact that the Claimed Invention is Within the Capabilities of One of Ordinary Skill in the Art is Not Sufficient by Itself to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

A statement that modifications of the prior art to meet the claimed invention would have been [obvious] because the references relied upon teach that all aspects of the claimed invention were *individually* known in the art is *not* sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. (citing *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993)).

In the instant case, even assuming *arguendo* that Ishizaki and Cheung "teach that all aspects of the claimed invention [are] individually known in the art", it is submitted that such a conclusion

"is not sufficient to establish a *prima facie* case of obviousness" because there is no *objective* reason on the record to combine the teachings of the cited prior art. Indeed, as discussed above, the Examiner does not even attempt to modify Ishizaki by adding the alleged first supporting material of Cheung, let alone provide the requisite motivation from the prior art for doing so. The Examiner has therefore failed, *per se*, to support a showing of obviousness under the § 103 "motivation to combine" requirements.

At best, the Examiner has attempted to show only that the elements (i.e., features of claim 15 and supporting material of claim 26) of the claimed invention are *individually* known without providing a *prima facie* showing of obviousness that the *combination* of elements recited in claims 15/26 is known or suggested in the art. For all the foregoing reasons, it is submitted that the proposed combination of Ishizaki in view of APA and Cheung is improper.

**B. Proposed combination does not disclose claimed invention**

Nonetheless, even assuming *arguendo* proper, it is respectfully submitted that the proposed combination does not disclose the claimed combination. Claim 26 recites in pertinent part, "bonding a first supporting material, *which is made of a plastic material or a metal*, in film form for supporting the semiconductor multilayer film onto the semiconductor multilayer film" (emphasis added). In contrast, the alleged supporting member of Cheung is Si and sapphire.

The Examiner is directed to MPEP § 2143.03 under the section entitled "All Claim Limitations Must Be Taught or Suggested", which sets forth the applicable standard:

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (citing *In re Royka*, 180 USPQ 580 (CCPA 1974)).

In the instant case, the pending rejections do not "establish *prima facie* obviousness of [the] claimed invention" as recited in claims 15 and 26 because the proposed combinations fail the "all the claim limitations" standard required under § 103.

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987). Accordingly, as claims 15 and 26 are patentable for the reasons set forth above, it is respectfully submitted that all claims dependent thereon are also patentable. In addition, it is respectfully submitted that the dependent claims are patentable based on their own merits by adding novel and non-obvious features to the combination.

For example, claim 29 stands rejected under 35 U.S.C. § 103 as being unpatentable over Ishizaki in view of APA, Cheung and Iwafuchi et al. '265. However, it is respectfully submitted that the Examiner has improperly modified a modifying reference. Although it is understood that there is no limit to the number of references that can be used to modify a *primary* reference in an attempt to reach the claimed invention, it is respectfully submitted that using a third reference to modify a feature taught in a *secondary* reference used to modify the primary reference is too attenuated from the claimed invention to be considered obvious.

In the instant case, the Examiner relies on Ishizaki as the primary reference, and then relies on Cheung as the secondary reference for modifying Ishizaki by adding a supporting material to the device of Ishizaki. The Examiner then modifies the supporting material of *Cheung* (i.e., secondary reference) with the materials disclosed by Iwafuchi et al. '265. Accordingly, the Examiner has improperly modified a modifying reference.

Furthermore, the Examiner's alleged motivation for making the modification is *per se* improper because it asserts only that the modification can be made rather than suggest the *desirability* thereof. In particular, the Examiner admits that the combination of Ishizaki, APA and Cheung does not disclose using a polymer as the supporting member and relies on Iwafuchi et al. '265 to obviate this deficiency. As a basis for the combination, the Examiner alleges on page 8 of the outstanding Office Action that the proposed combination would have been obvious "because plastic has a desired stiffness for holding the semiconductor film."

It is respectfully submitted that this motivation is insufficient for making a modification of a primary reference pursuant to the requisites established under § 103. For example, the Examiner does not identify any portion of the cited prior art that identifies plastic as having "a desired stiffness." This motivation appears to be created by the Examiner, NOT the cited prior art. Moreover, even assuming *arguendo* that Iwafuchi et al. '265 suggested plastic as "a desired stiffness", there is no evidence on the record that plastic would have a desired stiffness *relative to the material disclosed by the combination of Ishizaki in view of APA and Cheung*. That is, there is no evidence on the record that the cited prior art suggests that plastic would be preferred over the material already disclosed by the combination of Ishizaki in view of APA and Cheung. The Examiner is directed to MPEP § 2143.03 under the subsection entitled "Fact that References Can Be Combined or Modified is Not Sufficient to Establish *Prima Facie* Obviousness", which sets forth the applicable standard:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. (*In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990)).

In the instant case, even assuming *arguendo* that Ishizaki, APA and Cheung can be modified by Iwafuchi et al. '265, it is submitted that the "mere fact that [Ishizaki, APA, Cheung and Iwafuchi

et al. '265] can be combined ... does not render the resultant combination obvious" because nowhere does the prior art "suggest the *desirability* of the combination" as set forth by the Examiner.

That is, the Examiner has not provided evidence from the prior art that one of ordinary skill in the art would desire, for a disclosed purpose, replacing the material of Ishizaki in view of APA and Cheung with the plastic allegedly disclosed by Iwafuchi et al. '265. Indeed, the material of Ishizaki in view of APA and Cheung may perform better than plastic in some or all circumstances, which would teach away from the proposed modification. At best, the Examiner has attempted to show that the proposed combination *can* be made (rather than showing the prior art's *desirability* of the combination), which is not a sufficient basis for making a proposed combination under § 103 as set forth in the above-cited MPEP sections. That is, there is no *disclosed desire*, outside of Applicants' specification, for making the combination. In this regard, it is respectfully submitted that the Examiner merely selected bits and pieces of the cited prior art and relied solely on improper hindsight reasoning using only Applicants' specification as a guide to reconstruct the claimed invention.

Based on all the foregoing, it is respectfully submitted that the pending claims are patentable over the cited prior art. Accordingly, it is respectfully requested that the rejections under 35 U.S.C. § 103 be withdrawn.

Further, as it is believed that claim 15 is now in condition for allowance, it is respectfully requested that withdrawn claims 22-25 and 30 be rejoined as depending on an allowable independent claim. It is respectfully requested that new claims 34-44 be entered, which are also believed allowable for at least the reason that they depend on allowable claim 15.

### CONCLUSION

Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited. If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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